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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TRENT J. BRUNDAGE

Appeal 2007-1721
Application 09/854,408¹
Technology Center 2100

Decided: January 17, 2008

Before LANCE LEONARD BARRY, JAY P. LUCAS, and JOHN A. JEFFERY, *Administrative Patent Judges*.

LUCAS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF CASE

Appellant appeals from a final rejection of claims 1 to 28 under authority of 35 U.S.C. § 134. The Board of Patent Appeals and Interferences (BPAI) has jurisdiction under 35 U.S.C. § 6(b).

¹ Application filed May 10, 2001. The real party in interest is Digimarc Corporation.

Appellant's invention relates to method and system for accurately aligning a part to be placed on another part, as in a printed circuit board pick and place machine, based on an alignment grid printed on one of the parts in a digital watermark. In the words of the Appellant:

The present invention is directed to detecting the orientation and exact location of object 109, so that the pick and place machine 106 can appropriately place a part at a particular location on object 109. The watermarked image acquired by camera 108 is processed by a watermark detection and reading program. The watermark reading program detects the grid signal and from the grid signal the orientation and location of the object can be determined.

(Spec., 3-4.)

Claim 1 and Claim 21 are exemplary:

1. A method for controlling placement of a first part on a second part comprising,

placing a printed image containing a digital watermark on at least one of said parts,

capturing a digital image of said printed image,

reading a grid signal contained in said digital watermark, and

determining the angular rotation of said at least one of said parts from said grid signal.

21. A robot for handling items, said robot comprising:

an image sensor for sensing image data of an item including a machine-readable code provided on a surface thereof, wherein the machine-readable code comprises an orientation component;

electronic processing circuitry; and

memory including instructions stored therein for execution by the electronic processing circuitry, the instructions including instructions to:

analyze image data captured by the image sensor,

determine from analyzed image data an orientation of the item relative to the orientation component, and

provide position information based on a determined orientation of the item.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Wang	US 5,113,445	May 12, 1992
Rhoads	US 5,862,260	Jan. 19, 1999
Schaffer	US 6,282,528 B1	Aug. 28, 2001
		(filed Oct. 22, 1998)

Rejections:

Originally claims 12 to 16 and 21 to 26 were rejected under 35 U.S.C. § 103 over Wang in view of Rhoads, and claims 1 to 11, 17 to 20, and 27 to 28

were rejected under 35 U.S.C. § 103 over Wang in view of Rhoads and further in view of Schaffer. (App. Br., 6).

In the Examiner's Answer, page 3, the Examiner has entered a new ground of rejection, rejecting claims 12 to 16 under Wang in view of Rhoads and further in view of Schaffer. The Examiner explains that this change of rejections is a "direct result of the after final amendments made to claim 12 wherein the Applicant has added limitations similar to those of claim 17". (Ans., 3). We infer from this reasoning that claims 12 to 16 are rejected over Wang, Rhoads, and Schaffer instead of being rejected only over Wang and Rhoads.

This set of rejections is troublesome with respect to method claim 26, which is dependent on independent claim 17. Claim 26 is purported to be rejected over Wang in view of Rhoads, but is dependent from a claim with such limitations as to require a rejection over Wang, Rhoades, and Schaffer. In view of the Examiner's logic (*Id.*), and in the light of no contrary arguments from the Appellant, we will assume that claim 26 was intended to be rejected consistent with claim 17, over Wang, Rhoads, and Schaffer. We thus will treat the rejections as being as follows:

R1: Claims 21 to 25 stand rejected under 35 U.S.C. § 103 over Wang in view of Rhoads.

R2: Claims 1 to 20 and 26 to 28 stand rejected under 35 U.S.C. § 103 over Wang in view of Rhoads and further in view of Schaffer.

Appellant contends that the claimed subject matter is not rendered obvious by Wang in combination with Rhoads and Schaffer, for failure to teach all of the claimed limitations, for improper combining of references, and for other reasons to be discussed more fully below. The Examiner contends that each of the three groups of claims is properly rejected.

Rather than repeat the arguments of Appellant or the Examiner, we make reference to the Briefs and the Answer for their respective details. Only those arguments actually made by Appellant has been considered in this decision. Arguments which Appellant could have made but did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2004).²

We affirm the rejections.

ISSUE

The issue is whether Appellant has shown that the Examiner erred in rejecting claims 21 to 25 under 35 U.S.C. § 103(a) for being obvious over Wang and Rhoads and in rejecting claims 1 to 20, and 26 to 28 for being obvious over Wang, Rhoads and Schaffer. The issue stands or falls based on whether the references teach the claimed limitations as analyzed below.

² Appellant has not presented any substantive arguments directed separately to the patentability of the dependent claims or related claims in each group, except as will be noted in this opinion. In the absence of a separate argument with respect to those claims, they stand or fall with the representative independent claim. *See In re Young*, 927 F.2d 588, 590 (Fed. Cir. 1991).

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. Appellant has invented a pick and place robotic device and method with improved placement of the parts in which a watermark with a placement grid signal is included on the part. (Spec., 4). The grid signal may be redundantly coded and can be used to derive the orientation and location of the parts. (Spec., 5).
2. Wang teaches a data encoding system for a part which may be operated on by a machine responsive to markings on that part. Specifically, in a robotic system, Wang teaches a scanner attached to a machine tool which reads a pattern marked and encoded on a part and transmits control instructions responsive to those markings that control machining of that same part. (Col. 6, ll. 3-19).
3. The voluminous patent to Rhoads teaches encoding many types of information into patterns on a mark, such as a digital watermark. (Col. 90, l. 55 to 65). More specifically, it teaches including locating information in a grid function into the mark, and teaches fiducials (marks on printed circuit boards for placing components), for orienting an image of a part for the placement of that part. (Col. 72, ll. 43-59). Included in the patent are teachings of redundant embedding of information in the marks, and control bits and message bits embedded in the images. (Col. 91, ll. 45-53).

4. Schaffer teaches a pick and place machine for locating components onto a printed circuit board (PCB). A visual alignment system recognizes and orients the components, by 2D or 3D inspection of the component's leads, edges and bumps. (Col. 6, ll. 47-51).

PRINCIPLES OF LAW

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of prima facie obviousness or by rebutting the prima facie case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

"In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of the evidence and argument." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

In sustaining a multiple reference rejection under 35 U.S.C. § 103(a), the Board may rely on one reference alone without designating it as a new ground of rejection. *In re Bush*, 296 F.2d 491, 496 (CCPA 1961); *In re Boyer*, 363 F.2d 455, 458 n.2 (CCPA 1966).

References within the statutory terms of 35 U.S.C. § 103 qualify as prior art for an obviousness determination only when analogous to the claimed invention. *In re Clay*, 966 F.2d 656, 658 (Fed. Cir. 1992). Two

separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *In re Deminski*, 796 F.2d 436, 442 (Fed. Cir. 1986); see also *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979) and *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Furthermore, “‘there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness’ . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

ANALYSIS

From our review of the administrative record, we find that the Examiner has presented prima facie cases for the rejections of Appellant’s claims under 35 U.S.C. § 103. The prima facie cases are presented on pages 4 to 18 of the Examiner’s Answer.

In opposition, Appellant presents a number of arguments.

R1: Claims 21 to 25 stand rejected under 35 U.S.C. § 103 over Wang in view of Rhoads

After pointing out the deficiencies of each of the references, Appellant argues that the combination of Wang and Rhoads does not yield Appellant's invention of claim 21. (Reply Br., 4, bottom). The combination, it is alleged, fails to teach instructions to determine an orientation of a marked item relative to an orientation component in an image containing a machine-readable code; and to provide position information based on a determined orientation of the item.

Wang is cited for teaching the marking of an item with encoded data, as described in (FF2) above, said markings controlling the operation of robotic devices, such as a machining tool that machines a part with the control markings. The Examiner combines this teaching with that of Rhoads, as described in (FF3), indicating that one of ordinary skill in the art would look to Rhoads for the teachings of the other elements of the claims. Indeed, as specified by the Examiner on page 19 of her Answer, the memory, microprocessor and concomitant instructions are all present in Rhoads. (Col. 2, l. 64+). Rhoads especially mentions orientation and positional information from a gridding function analyzing an image, at Column 72, lines 49 to 59. We do not find error in the Examiner's combining, and applying these teachings.

Appellant argues improper motivation to combine these references. (Br., 7). Both of the references address the same field of endeavor, namely digital markings controlling devices manipulating an item in an industrial process, thus satisfying the tests for combining references indicated in the

KSR and the *In re Kahn* (see citations above) guiding opinions. We find that one of ordinary skill in the art may seek to enhance the information content of the markings on the controlled devices in Wang to better control the manipulation of the items, and Rhoads' teachings supply that information.

Appellant's comments addressing the roadway signs of Wang (Reply Br., 6, middle) are not on point. See (FF2) above. Wang's teaching of the markings on the item being machined are relevant (Col. 6, line 15).

We do not find error in the Examiner's rejection of claims 21 to 25 over Wang in view of Rhoads.

R2: Claims 1 to 20 and 26 to 28 stand rejected under 35 U.S.C. § 103 over Wang in view of Rhoads and further in view of Schaffer.

Appellant contends that Examiner erred in rejecting claims 1 to 20 and 26 to 28 over Wang in view of Rhoads and Schaffer.

With regard to claim 1, Appellant argues the deficiencies of individual references, notably Wang, do not contain a barcode. (Reply Br., 8.) Claim 1 is addressed to a digital watermark, which is recited in Rhoads in column 90. Rhoads also teaches the claimed grid signal, as mentioned above (Col. 72) for orienting and scaling information on the supporting part. Wang teaches the manipulation (machining) of the marked part. Schaffer adds context to the teaching, presenting a pick and place machine environment. Appellant's arguments alleging the Examiner erred in interpreting and combining these teachings are not deemed persuasive.

With regard to claim 12, Appellant contends that Examiner erred in applying this rejection as the Wang reference fails to teach or suggest a controller responsive to the orientation data derived from the digital watermark; and a controller controlling the positioning and movement of an item that includes the digital watermark. (Reply Br., 9, middle). Appellant then discusses the failure of Rhoads to include controlling a robot. (*Ibid*, bottom). The Examiner addresses these piecemeal arguments, indicating how the art is being applied, in her rejection. (Ans., 21-22).

In view of the arguments as presented by the Examiner, we do not find error in the rejection.

With regard to claim 17, we have reviewed Appellant's arguments (Reply Br., 10+) and find the issues properly addressed by the Examiner. (Ans., 26-28). We especially note Rhoads teachings of steganographic techniques, applied in the rejection by the Examiner. (Col. 95, l. 20+).

Arguments addressed to claim 6 are similar in subject and analysis to claim 1.

CONCLUSION OF LAW

Based on the findings of facts and analysis above, we conclude that the Examiner did not err in rejecting claims 1 to 28.

DECISION

The Examiner's rejection of claims 1 to 28 is Affirmed.

Appeal 2007-1721
Application 09/854,408

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

rwk

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